

ENGINEERING DATA
STROMBERG-CARLSON NO. 420 RADIO RECEIVERS

STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY
ROCHESTER, NEW YORK

IDENTIFICATION TABLE

Model	Input Power Frequency	Chassis	Cabinet	Speaker
420-H	50-60 Cycles	30313	30366	27557
420-HB	25-60 Cycles	30314	30366	27557
420-L	50-60 Cycles	30313	30367	27605
420-LB	25-60 Cycles	30314	30367	27605
420-PL	50-60 Cycles	30870	30872	27605
420-PLB	25 Cycles only	30871	30872	27605
420-PR	50-60 Cycles	30870	30869	30873
420-PRB	25 Cycles only	30871	30869	30873

SPECIFICATIONS

Type of Circuit	Superheterodyne with Electric Tuning
Tuning Ranges	A—540 to 1700 Kc. C—5800 to 18000 Kc.
Number of Tubes	Seven
Type of Tubes	6A8G, Modulator and Oscillator 6K7, I. F. Amplifier 6H6, Demodulator and A. V. C. 6SQ7, Audio Amplifier 6F6G, Output 80, Rectifier 6AF6G, Tuning Indicator
Voltage Rating	105 to 125 Volts
Power Frequency Rating	Standard 50-60 Cycles, also available 25-60 Cycles
Input Power Rating	57 Watts
Intermediate Frequency	455 Kilocycles
Speaker Voice Coil Impedance at 400 Cycles	Approximately 1.5 Ohms
Speaker Field Coil Resistance	1650 Ohms

FEATURES

General

This is a seven tube, two gang, two band receiver with the 1600 Kc. to 1700 Kc. police band included in the broadcast band.

Six button substitution capacitor type automatic tuning is provided. Tone is adjusted by a step tone control, and the dial is of the slide rule type, edge lighted to provide clear visibility without glare.

Provision is made for a record player to be used with this receiver without additional wiring. The chassis is designed to provide excellent sensitivity and tone quality, and the power output is greater than previously found in a set of this type. The selectivity and freedom from interference should be satisfactory under all normal reception conditions.

Special Circuits

A tuning indicator having two apertures, one for strong signals and one for weak signals, is used with this chassis. One aperture will close with a signal of approximately 100,000 microvolts, and the other will not close even with a two volt signal.

Iron core coils are used in the oscillator and antenna circuits to provide greater stability and, in addition, a thermal drift compensator is included in the circuit.

The high frequency end of each band is spread out by means of special capacitor plates, to provide greater ease in tuning.

Automatic Tuning

A substitution capacitor type of tuning is employed and the stations may be easily located using only one adjusting screw. Furthermore, each adjusting screw is provided with a vernier to make accurate adjustments possible.

Phonograph Operation

A socket is provided on the back of the chassis into which a record player may be plugged, and a switch is provided on the front of the chassis for switching from "Radio" to "Phonograph".

Television

Switching to "Phonograph" also makes the audio amplifier and loud speaker available for use with television receivers designed for this type of sound reproduction.

ACCESSORIES

Antenna

For best results use a Stromberg-Carlson Antenna. These Antennas are supplied in kits containing all the necessary parts for mounting and installation.

Playing Records

To obtain the best quality of phonograph reproduction a Strongberg-Carlson record player is recommended. They are designed for use with this receiver, and all that is necessary is to connect the record player to the single prong socket provided in the chassis and proceed to operate. The volume may be controlled with the volume control at the receiver, or (if such is provided) with the volume control on the record player.

A low impedance pick-up may also be used, but a matching transformer must be placed between the phonograph pick-up and the chassis.

Headset Attachment

Headphones can be very simply attached to this receiver. Ask for Pc. No. 28303 Headset Package Assembly, which comes complete with headphones and installation instructions.

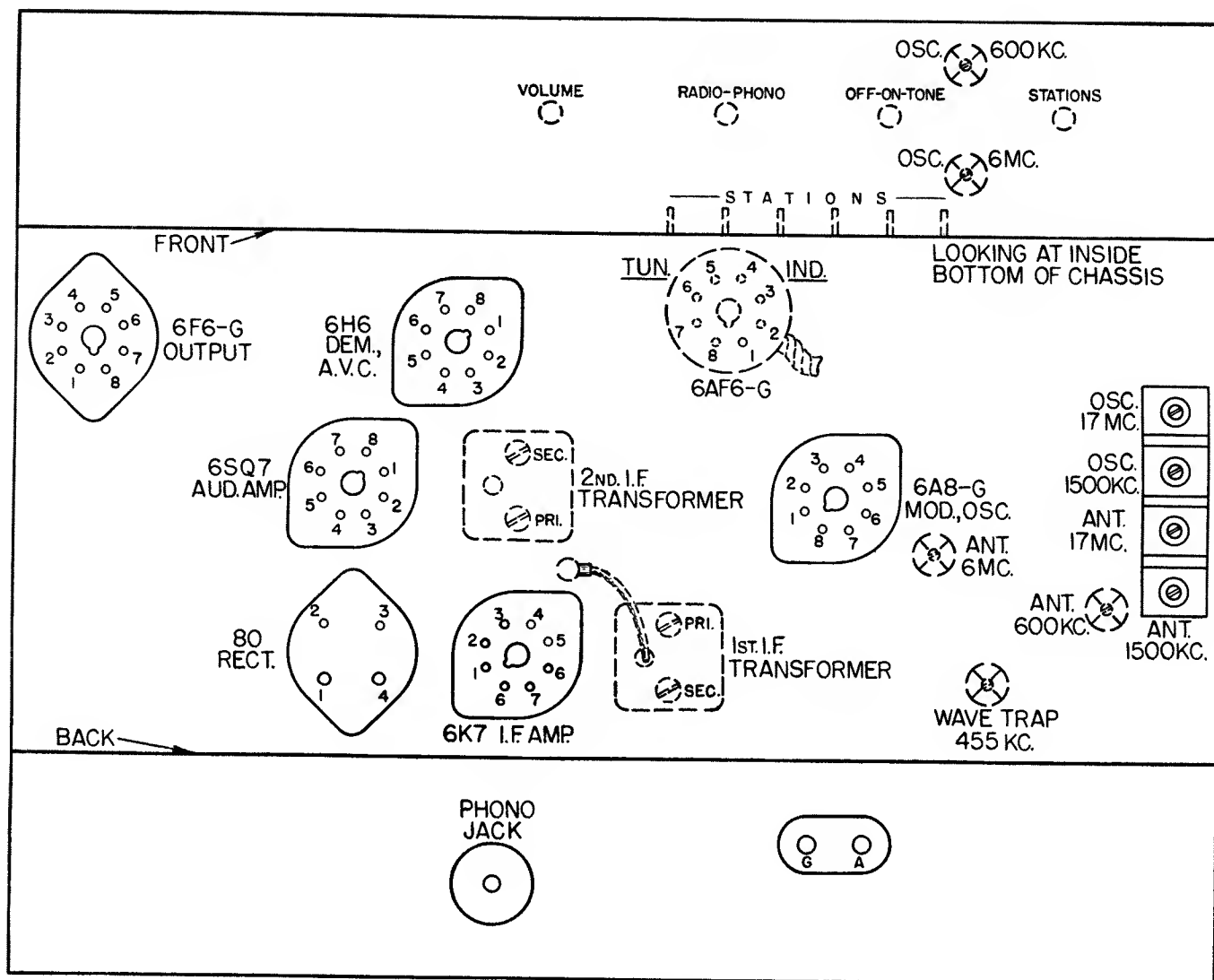
Care of Cabinet

The finish of Stromberg-Carlson Cabinets should be protected by using Stromberg-Carlson Cabinet Polish regularly. It is available in pint cans, designated as Pc. No. 28601.

Nicks and scratches of most kinds can be repaired quickly and easily by proper use of the Pc. No. 26962 Touch-Up Kit. Complete instructions are provided with each kit.

Tools

Stromberg-Carlson can supply all the tools required for working on these sets. For example:
SD-29 Phillips Head Screwdriver
No. 24608 Aligning Tool
Also pliers, cutters, screwdrivers, etc.



Location Chart

ALIGNING INFORMATION

NEVER ALIGN UNLESS ABSOLUTELY NECESSARY.

Use a good modulated signal generator (test oscillator) with variable output voltage and a sensitive output meter across the voice coil of the speaker.

Always align using the smallest possible input from the signal generator (except when wave trap adjustment is made). A strong signal makes adjustments inaccurate.

Always have receiver volume control full on.

Never align with tone control in "Bass" position.

See location chart above for location of all the aligning adjustment screws.

Aligning Procedure (follow this order exactly)

I. Dial pointer adjustment.

With the plates of the gang tuning capacitor fully engaged, set the dial pointer directly on the vertical line located at the extreme low frequency end of the short wave band.

II. Intermediate frequency adjustments.

1. Set the range switch to Standard Broadcast position.
2. Tune set to extreme low frequency end of the dial.
3. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
4. Introduce a modulated signal of 455 Kilocycles to the grid cap of the 6A8G Tube, using a 0.1 microfarad capacitor in series with the output lead of the signal generator. (Do not remove the grid clip from this tube.)

5. Adjust the I. F. Aligners for maximum output in the following order:

- A. Secondary of second I. F. transformer.
- B. Primary of second I. F. transformer.
- C. Secondary of first I. F. transformer.
- D. Primary of first I. F. transformer.

III. Radio frequency adjustments.

Short Wave Range (C Band)

- 1. Replace the 0.1 microfarad capacitor in series with the output lead of the signal generator with a 400 ohm carbon type resistor, and connect it to the antenna terminal of the chassis.
- 2. Set the range switch to the short-wave range position (C Band).
- 3. Set the signal generator frequency and the receiver tuning dial to 6 megacycles.
- 4. Adjust the 6 megacycles oscillator and antenna (iron cores) for maximum signal.
- 5. Set the signal generator frequency and the receiver tuning dial to 17 megacycles.
- 6. Adjust the 17 megacycles oscillator and antenna aligning capacitors for maximum signal.
- 7. Repeat operations three and four.
- 8. Repeat operations five and six.

Standard Broadcast Range (A Band)

- 1. Replace the 400 ohm carbon type resistor in series with the output lead from the signal generator with a 200 micro-microfarad capacitor.
- 2. Set the range switch to the Standard Broadcast Range (A Band).
- 3. Set the signal generator frequency and the receiver tuning dial to 600 Kc.
- 4. Adjust the 600 Kc. oscillator and antenna (iron cores) for maximum signal.
- 5. Set the signal generator frequency and the receiver tuning dial to 1500 Kc.
- 6. Adjust the 1500 Kc. oscillator and antenna aligning capacitors for maximum signal.
- 7. Repeat operation three and four.
- 8. Repeat operation five and six.

IV. Wave Trap Adjustment.

(Leave the receiver connected in the same manner as when adjusting the Standard Broadcast Range ("A" Band)).

- 1. Tune set to 1000 Kc.
- 2. Set the signal generator frequency to 455 Kc. and introduce a fairly strong modulated signal to the receiver.
- 3. Adjust the wave trap aligner for minimum signal.

ADJUSTING DIAL LAMP

The dial on this receiver is edge lighted, and for proper illumination it is very important that the dial light be adjusted so that the filament is exactly opposite the edge of the glass.

To make this adjustment simply slide the pilot light socket back and forth on its mounting bracket until maximum illumination is obtained.

NORMAL VOLTAGE READINGS

Take all readings with chassis operating and tuned manually to 1000 Kc.—no signal.

Use a line voltage of 120 volts, or make allowance for the variation.

Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt.

Take all D. C. readings on the 500 volt scale except when an asterisk appears.

Read from indicated terminals to chassis base.

See location chart on Page 4 for position of terminals.

A. C. voltages are indicated by italics.

To measure voltages of 6AF6G tube remove the metal cover on the tuning indicator socket and read from indicated terminals.

Tube	Circuit	Cap	Terminals of Sockets								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts A. C.
6A8G	Mod.—Osc.	0	0	0	+255	+99	—	+175	6.3	+2.5*	2-7	6.3
6K7	I. F. Amp.	0	0	0	+257	+85	+2.5*	+255	6.3	+2.5*	2-7	6.3
6H6	Dem.—A. V. C.	—	0	0	—	0	—	+60	6.3	0	2-7	6.3
6SQ7	Audio Amp.	—	0	—	0	0	0	+95	6.3	0	7-8	6.3
6F6G	Output	—	0	0	+245	+257	—	—	6.3	+16	2-7	6.3
6AF6G	Tuning Ind.	—	—	0	+80	+115	+230	—	6.3	+100	2-7	6.3
80	Rectifier	—	+365	350	350	+365	—	—	—	—	1-4	5

*Read on lowest possible scale of voltmeter.

CONTINUITY TEST

CAUTION: Remove all tubes and disconnect the receiver from the power supply before making continuity test.

Use a good meter capable of measuring accurately up to several megohms.

The resistances given are often approximate, owing to electrolytic capacitors in the circuit.

When this is the case, be sure to reverse the test leads and read the highest resistance.

Read from indicated terminals to chassis base unless otherwise specified.

See location Chart on Page 4 for position and numbering of terminals.

TERMINALS OF SOCKETS										
Tube	Circuit	Cap	1	2	3	4	5	6	7	8
6A8G	Mod.—Osc.	A	S	S	20000 Ω	B	50000 Ω	C	S	150 Ω
6K7	I. F. Amp.	D	S	S	18000 Ω	E	150 Ω	F	S	150 Ω
6H6	Dem.—A. V. C.	—	S	S	G	S	H	280000 Ω	S	S
6SQ7	Audio Amp.	—	S	10M	S	S	S	280000 Ω	S	S
6F6G	Output	—	S	S	19000 Ω	19000 Ω	1M	1M	S	400 Ω
6AF6G	Tuning Ind.	—	O	S	250000 Ω	100000 Ω	15000 Ω	O	S	6000 Ω
80	Rectifier	—	19000 Ω	150 Ω	150 Ω	19000 Ω	—	—	—	—
—	Speaker Socket	—	19000 Ω	S	S	800000 Ω	O	O	800000 Ω	—

Symbols used on chart are as follows: Ω —ohms; M—megohms; S—short; O—open.

OTHER TESTS NOT SHOWN ON CHART

Radio-Phono Switch Set To		
Note	Radio Position	Phono Position
A	1.8M	O
B	80,000 Ω	1M
C	50,000 Ω	1M
D	1.5M	O
E	100,000 Ω	1M
F	25,000 Ω	1M
G	550,000 Ω	O
H	550,000 Ω	O

Phonograph jack terminal to chassis base.

Radio Phonograph switch in Radio position "open".

Radio Phonograph switch in Phonograph position 500,000 ohms.

Antenna terminal to chassis base 70 ohms.

Ground terminal to chassis base "short".

Between terminals of A. C. plug "open" with A. C. switch open, 7 ohms with A. C. switch closed. Terminals of A. C. plug to chassis base "open".

Front terminal of Push Button Unit (orange-white wire) to chassis base.

Radio Phonograph switch in Radio position 1.8M.

Radio Phonograph switch in Phono position "open".

Rear terminal of Push Button Unit (orange wire) to chassis base Range switch in Push Button position "open".

Range switch in Standard Broadcast position (A Band) 120 ohms.

Range switch in Short Wave position (C Band) 120 ohms.

R. F. coil tests measured directly across R. F. coil terminals with Range switch set in standard broadcast position (A Band): L3—3 ohms, L4—.2 ohms, L5—"short", L6—.2 ohms, L7—4 ohms, L8—.2 ohms, L9—"short".

INSTRUCTIONS FOR SETTING UP PUSH BUTTONS

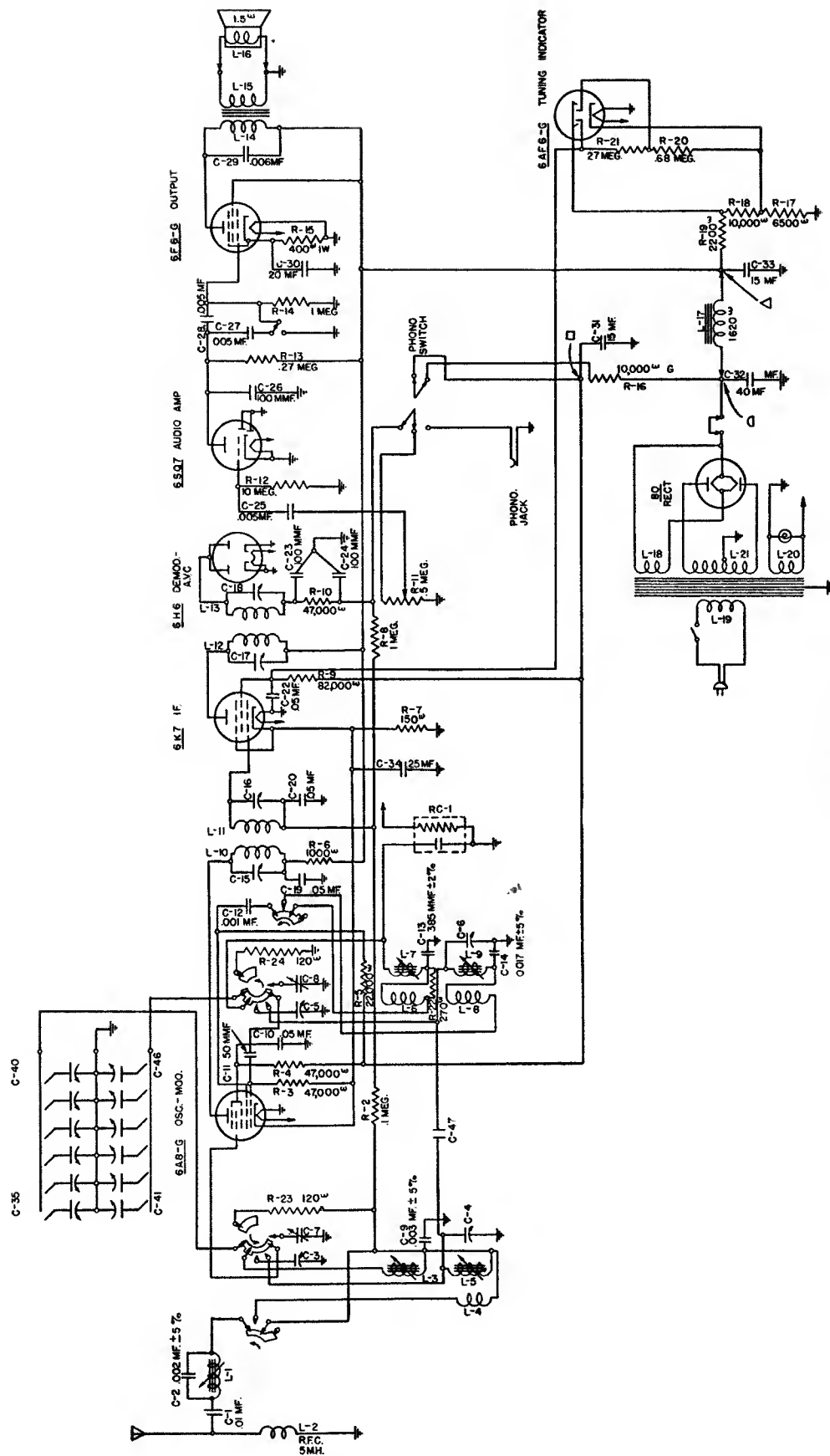
IMPORTANT: The stations selected should be the local or favorite stations which give good reception at all times.

Set up stations in the daytime to avoid unnecessary interference.

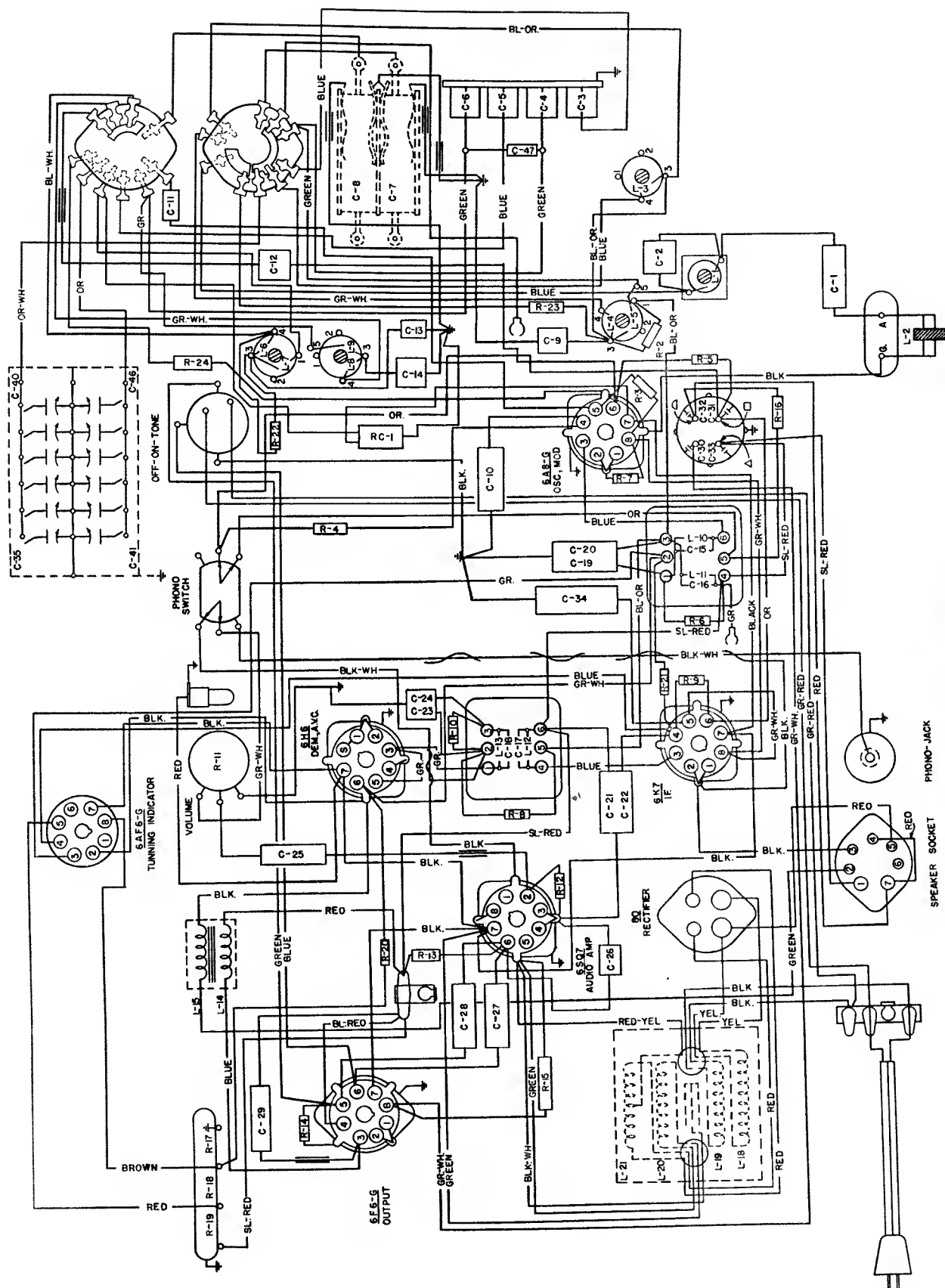
Allow the set to run for about twenty minutes before setting up stations.

Always use the tuning indicator unit when setting up stations in order to determine when the station is exactly in tune.

1. Remove the push button escutcheon by removing the screws and pulling downward and outward.
2. Put the call letters of the selected stations in place above the push buttons. The stations should be arranged according to frequency with the highest frequency at the right and the lowest frequency at the left, just as on the dial. (The call letters will be found inside the envelope stapled inside or underneath the cabinet.)
3. Tune in manually the highest frequency station to be set up and note carefully the program being transmitted.
4. Turn the range switch to the push button position and push the highest frequency button, then adjust the large screw over this button until the desired program is heard. (If the proper adjusting screw cannot be reached it will be necessary to turn the station selector control until the screw is accessible through one of the holes in the pulley.)
5. After the large screw is carefully adjusted, adjust the small vernier screw for maximum closing of the tuning indicator. (Be sure the large adjusting screw does not move while turning the vernier screw.)
6. Set up the other five stations in the same manner.
7. Recheck the adjustment of each adjusting screw.



Schematic Circuit



Wiring Diagram

REPLACEMENT PARTS

Use genuine Stromberg-Carlson parts. It will be to your advantage. They are made for use in Stromberg-Carlson receivers. The specifications are correct and the same high quality material and workmanship is used as in the whole radio receiver. Don't ruin a good receiver with an inferior part.

Capacitors

Piece Number	Circuit Designation	Part
24559	C-26	100 mmf.
24637	C-14 . . . . .	.0017 mf.
24994	C-10 . . . . .	.05 mf.
25149	C-1 . . . . .	.01 mf.
25487	C-12 . . . . .	.001 mf.
25533	C-29 . . . . .	.006 mf.
26512	C-23, 24	2—100 mmfs.
27108	C-19, 20, 21, 22	2—.05 mfs.
27305	C-11	50 mmf.
29973	C-34 . . . . .	.25 mf.
30116	C-9 . . . . .	.003 mf.
30237	C-13	385 mmf.
30322	C-25, 27, 28 . . . . .	.005 mf.
30374	C-7, 8	Variable Capacitor (2 gang)
30399	C-30, 31, 32, 33	1—40 mf. 450 V, 1—15 mf. 350 V 1—15 mf. 300 V, 1—20 mf. 25 V
30433	C-3, 4, 5, 6	Aligner Assembly

Coils, Transformers and Speakers

30238	L-1, C-2	Wave Trap
30149	L-3	Antenna Coll "A" Band
30150	L-6, 7	Oscillator Coll "A" Band
30401	L-4, 5	Antenna Coll "C" Band
30402	L-8, 9	Oscillator Coll "C" Band
30332	L-2	R. F. Choke Coil
30397	L-18, 19, 20, 21	Power Transformer 50/60 Cycles
30398	. . . . .	Power Transformer 25/60 Cycles
30127	L-10, 11, C-15, 16	1st I. F. Transformer
30405	L-12, 13, C-17, 18	2nd I. F. Transformer
27557	. . . . .	Speaker for 420-H Receiver
27605	. . . . .	Speaker for 420-L, PL, Receiver
30873	. . . . .	Speaker for 420-PR Receiver
25492	. . . . .	Speaker Cone for Speaker used on 420-H Receiver
27808	. . . . .	Speaker Cone for Speaker used on 420-L Receiver
22255	. . . . .	Speaker Cone for Speaker used on 420-PR Receiver
30407	L-14, 15	Output Transformer

Controls and Knobs

26061	. . . . .	Off-On-Tone Control
30404	. . . . .	Range Switch
28918	. . . . .	Phono-Television Switch
30136	R-11	Volume Control
30416	C-35 to C-46 incl.	Electric Tuning Switch
27802	. . . . .	Large Tuning Knob
28827	. . . . .	Small Knob with Arrow
28843	. . . . .	Small Plain Knob
29084	. . . . .	Knob with Arrow
29461	. . . . .	Large Plain Knob
27628	. . . . .	Felt Washer for Knobs

Resistors

26322	R-23, 24	120 Ohms, Type "E"
26323	R-7	150 Ohms, Type "E"
26326	R-22	270 Ohms, Type "E"
26333	R-6	1,000 Ohms, Type "E"
26349	R-5	22,000 Ohms, Type "E"
26353	R-3, 4, 10	47,000 Ohms, Type "E"
26356	R-9	82,000 Ohms, Type "E"
26357	R-2	100,000 Ohms, Type "E"
26362	R-13, 21	270,000 Ohms, Type "E"
26367	R-20	680,000 Ohms, Type "E"
26369	R-8, 14	1 Megohm, Type "E"
26381	R-12	10 Megohms, Type "E"
28758	R-15	400 Ohm, 1 Watt
30400	R-17, 18, 19	Voltage Divider
30417	R-16	10,000 Ohms, Type "G"
30292	RC-1	Compensator Unit

Miscellaneous Parts

26122	.	.	.	.	.	.	Antenna and Ground Terminal Strips	.	.	.	.	.	.	.
28652	.	.	.	.	.	.	A. C. Input Cord	.	.	.	.	.	.	.
30055	.	.	.	.	.	.	Dial Scale	.	.	.	.	.	.	.
30276	.	.	.	.	.	.	Dial Pointer	.	.	.	.	.	.	.
30172	.	.	.	.	.	.	Dial Escutcheon	.	.	.	.	.	.	.
30174	.	.	.	.	.	.	Electric Tuning Escutcheon	.	.	.	.	.	.	.
30341	.	.	.	.	.	.	Screw for Mtg. Dial Escutcheon	.	.	.	.	.	.	.
30932	.	.	.	.	.	.	Screw for Mounting Electric Tuning Escutcheon	.	.	.	.	.	.	.
26287	.	.	.	.	.	.	Pilot Lamp	.	.	.	.	.	.	.
30269	.	.	.	.	.	.	Rubber for Mtg. Dial Glass	.	.	.	.	.	.	.
30355	.	.	.	.	.	.	Rubber Bumper	.	.	.	.	.	.	.
30224	.	.	.	.	.	.	Phonograph Plug	.	.	.	.	.	.	.
30226	.	.	.	.	.	.	Phonograph Jack	.	.	.	.	.	.	.
30225	.	.	.	.	.	.	Guard for Phono Jack	.	.	.	.	.	.	.
30151	.	.	.	.	.	.	8-Prong Socket	.	.	.	.	.	.	.
30152	.	.	.	.	.	.	7-Prong Socket	.	.	.	.	.	.	.
30153	.	.	.	.	.	.	4-Prong Socket	.	.	.	.	.	.	.
30265	.	.	.	.	.	.	Pulley Assembly	.	.	.	.	.	.	.
30275	.	.	.	.	.	.	Bronze Drive Cord	.	.	.	.	.	.	.
SD-67	.	.	.	.	.	.	Dial Drive Cord	.	.	.	.	.	.	.
28694	.	.	.	.	.	.	Pilot Lamp Socket Assembly	.	.	.	.	.	.	.
30261	.	.	.	.	.	.	Tuning Indicator Cable	.	.	.	.	.	.	.
29628	.	.	.	.	.	.	Spring for Drive Cord	.	.	.	.	.	.	.
30169	.	.	.	.	.	.	Station Call Letters	.	.	.	.	.	.	.

Accessories

SD-29	.	.	.	.	.	.	Phillips No. 1 Screwdriver	.	.	.	.	.	.	.
24608	.	.	.	.	.	.	Aligning Tool	.	.	.	.	.	.	.
28601	.	.	.	.	.	.	Cabinet Polish (pint can)	.	.	.	.	.	.	.
26692	.	.	.	.	.	.	Furniture Touch-up Kit	.	.	.	.	.	.	.
28303	.	.	.	.	.	.	Headphone Package Assembly	.	.	.	.	.	.	.

SUPPLEMENTARY ENGINEERING DATA

NO. 420 PHONOGRAPH MODELS

STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY
ROCHESTER, NEW YORK

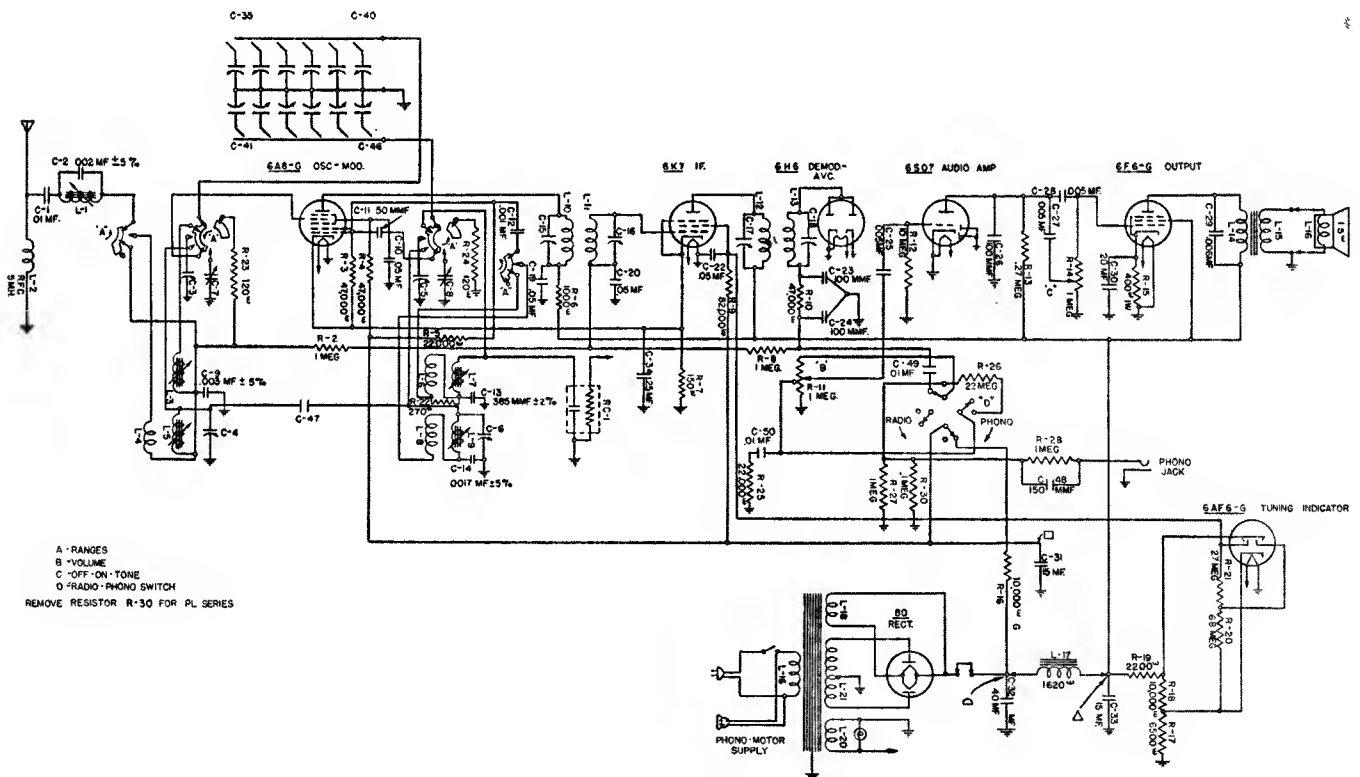
The No. 420-PR Receivers are equipped with a single record phonograph unit using a crystal pick-up in conjunction with a specially equalized circuit. The phonograph unit is designed to play the standard 10 or 12 inch 78 R.P.M. records.

The No. 420-PL Receivers are equipped with an automatic record changer using a crystal pick-up in conjunction with a specially equalized circuit. This record player shifts and plays 10 or 12 inch records.

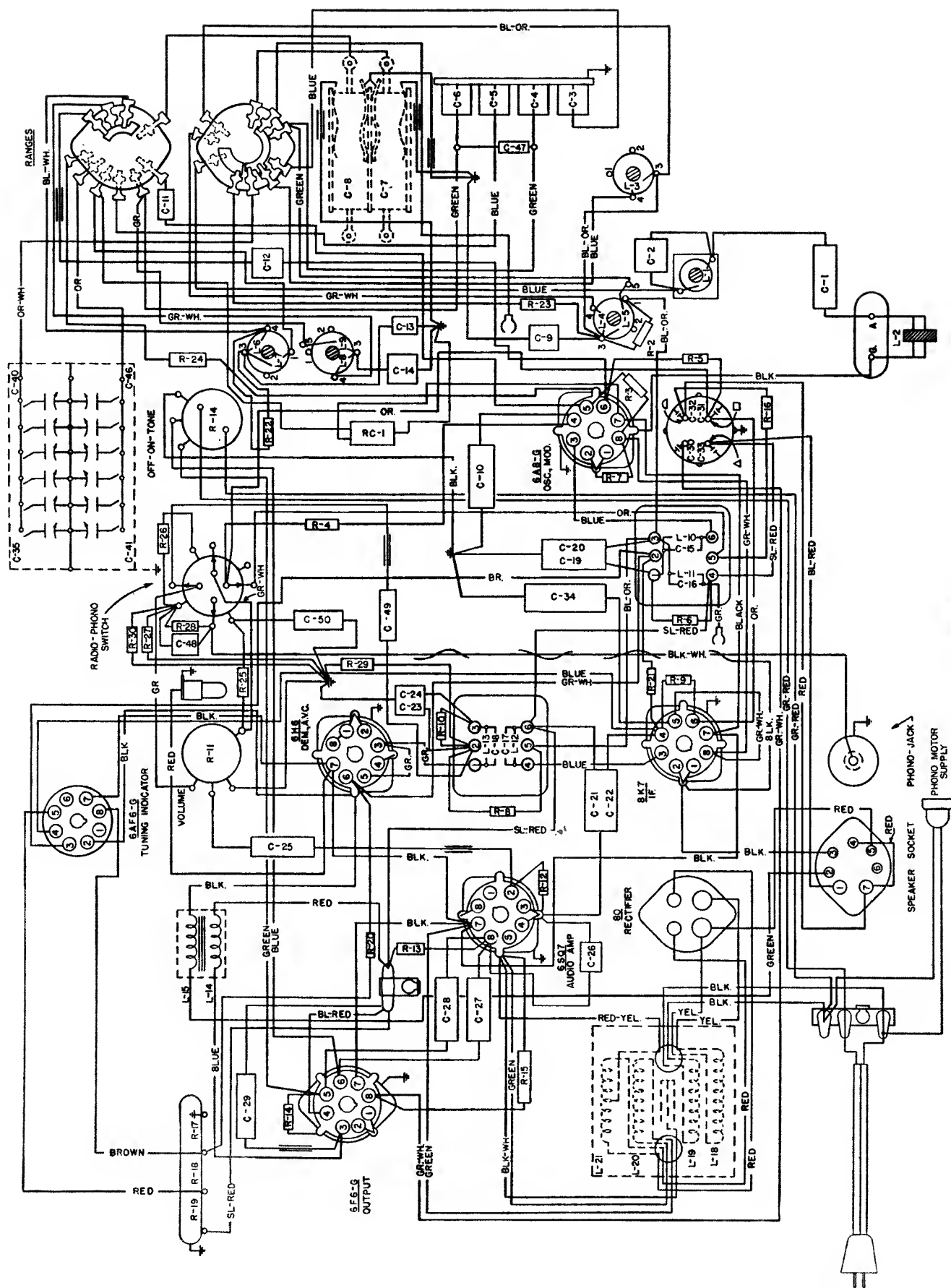
Tone is adjusted on these receivers by means of a variable tone control.

Replacement Parts are the same as the 420-H and L Receivers, except for the following:

Piece Number	Circuit Designation	Part
28686	.	Phono Switch
29560	R-11	Volume Control
27311	R-14	Off-On Switch and Tone Control
30930	.	Connector Assembly



Schematic Circuit



Wiring Diagram